PRENTICE COMPUTER CENTRE

UNIVERSITY OF QUEENSLAND, ST. LUCIA, QUEENSLAND, AUSTRALIA. 4067.

NEWSLETTER

N-251 19-May-80

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Authorized by the Director of the Computer Centre

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1.0 THE DN87 SAGA

As you will have noted, we have not achieved satisfactory performance with the DN87B front end communications computer. We have put a great deal of both software and hardware effort into tracking the elusive problems. We recently achieved a breakthrough on the software side by finding an interrupt instruction in the DN87 software which associated with timing considerations could cause the DN87 to crash. We amended the software and ran extensive trials without recurrence of the normal problems. We were somewhat confident and even a little happy that service would improve.

On the morning of 13 May during routine maintenance, the D87B rack was pulled out from the cabinet which was normal. What was not normal was that somehow a wire carrying power was dislodged and in the narrow clearance shorted across the bus. This burnt out a number of chips. We, of course, are extremely disappointed and apart from working flat out to restore the system, we can only join with users connected through the DN87B in wishing it had not happened.

Towards the end of the year, we will be installing a front-end circuit switch. This will enable switching of lines between DN87s and allow some (albeit degraded) service if one DN87 is out of service.

Director
extension 2189

2.0 COURSES AND SEMINARS

2.1 June Courses

Listed below are the courses to be conducted by the Centre during June.

Please note - Enrolments for all courses below will be accepted only from users with some familiarity with (a) the use of terminals, (b) editing and (c) batch processing. These topics are covered in the Introductory Courses offered by the Centre; hence attendance at an Introductory Course should be considered as the minimal requirement for enrolment at the following courses:

Course	Dates	Times
a) Introduction to 1022	Mon 9 June- Fri 13 June	2 pm - 5 pm

Comments:
1022 is a general-purpose data management software system. Features include simple handling of large data bases, fast retrieval capability and comprehensive report writer.

b) Introduction to SPSS	Tues 17 June- Thurs 19 June	9 am - 12 noon 2 pm - 5 pm

Comments:
Sessions will centre around the audio-visual course produced at Newcastle-on-Tyne University.

c) Introductory Fortran	Mon 23 June- Fri 27 June	9 am - 12 noon 2 pm - 5 pm

Comments:
This course uses the audio-visual course developed at the University of London. The accompanying manual ($4.10) must be purchased from the Centre at time of Fortran Course.

General Information on Enrolment:

(i) Staff and post-graduate students are admitted free to courses. Other participants are charged at the rate of $10.00 per half-day.

(ii) Numbers admitted to courses are limited.

(iii) Registrations for all courses will be accepted by Barry Maher extension 3022.

(Information, requests, etc. for the following sections may also be directed to the same extension.)

2.2 Requests for Courses

The Centre organizes courses in commonly-used areas on a regular basis. However, requests for additional courses (either repeat courses or new courses) will always be considered, and implemented if possible.

2.3 Information Seminars

If requested, the Centre will attempt to supply a representative to conduct informal sessions with interested groups (e.g. perhaps as a prelude to possible attendance at an introductory course), to outline the services provided by and facilities available at the Centre, and uses which may be made of these services and facilities by groups and individuals with little or no computing experience.

Barry Maher
extension 3022

3.0 ONLINE SOFTWARE CATALOGUE

An online software catalogue scanning program "CATSCN", is now available on SYS:. This program allows users to obtain information on software routines and programs using a "keyword" approach.

The following is an example run of CATSCN:

```
.R CATSCN

Online Catalogue Scanner
     8471 Records in Key Index

Keyed on Fields:
[1]   -->  Record Key
[2]   -->  Name
[3]   -->  Category
[4]   -->  Key Words
[5]   -->  Description

     0 Entries in pool
     0 Record(s) live
*FIND FORTRAN+MACRO\F10      (Find Fortran AND Macro  and  EXCLUDE
F10)
    11 Entries in pool
     3 Record(s) live
*TYPE/F                        (TYPE RECORDS WITH FIELD NAMES)

Field Names added

[ 1] Record Key                hash
[ 2] Name                      Hash
[ 3] Category                  Data-base
[ 4] Key Words                 Hash address files
                               MACRO,Cobol,Fortran
```

```
[ 5] Description              Hash address file system for
                              Fortran,Cobol,Macro.

[ 6] Library                  Hash
[ 7] U.Q. Library             refer Program Librarian
[ 8] Support (1,2,3           1
[ 9] Help-Doc                 Refer Program Librarian
[10] Author                   U.Q.

[ 1] Record Key               B-TREE
[ 2] Name                     B-Treo^O

* P

FORTRAN                       [ 1];     1
FORTRAN                       [ 2];     2
FORTRAN                       [ 3];    94
FORTRAN                       [ 4];    24
FORTRAN                       [ 5];    57
MACRO                         [ 1];     2
MACRO                         [ 2];     2
MACRO                         [ 4];    12
MACRO                         [ 5];    15
F10                           [ 4];     1
F10                           [ 5];     4
    11 Entries in pool
     3 Record(s) live
*HELP
```

How to use the Search Function
A Live Record is a strike that satisfies the search.

(1) By using the FIND Command a "POOL" of Keywords and a set of "LIVE" records is established. The POOL contains those keywords that were found to establish the LIVE records.

If the POOL overflows it starts again with a warning.

To further discriminate in the search, use the "EXCLUDE" or "AND" command, which will remove from the live list, those records which (a) do not satisfy an AND command (i.e. both connditions must hold), or (b) those records which are to be dropped due to the EXCLUDE command.

AND and EXCLUDE must be preceded by a FIND (cannot EXCLUDE anything from an empty set!).

To clear the POOL use the ZERO command. To examine the POOL use the POOL command.

To Select from a specific Field, enclose the field number in "[" and "]", e.g.

Find [10]abc* = search field 10 for abc*

The field MUST be a keyed field.

```
      Connectives may be used, e.g. "Find abc+xyz"
      Where "+"       = Both conditions must hold
      Also ","        = add to the pool
           "\"        = exclude these
      Range from "A" to "B"
      Entered as A>B, i.e. all records from "A" to "B"
      Another example:
      Find abc*+xyz\196?=Find all abc* (wild)
                         "AND" xyz must also hold
                         "EXCLUDE" all 196?.
      NOTE: Bracketed Search requests are NOT supported.
      e.g. Find ((A+B),(C)) is Illegal!

      TYPE for a display of the current FINDS

      The following Commands are defined:
      AND         Records must contain names Keyword(s) as well.
      KEY         Type the names of Keyed Fields
      POOL        On the TTY: Type contents of the POOL.
      EXCLUDE     Named Keywords from the search.
      FIND        Find the named Keywords.
      HELP        Type help command.
      TYPE        On the TTY: the result of the search, all
                  live records.
      ZERO        Clear the POOL and start again.

      11 Entries in pool
       3 Record(s) live
* Z
       0 Entries in pool
       0 Record(s) live
* ^Z

END OF EXECUTION
CPU TIME: 1.16 ELAPSED TIME: 6:9:28
Exit
```

CATSCN is based on the bibliographic option in VG, due to be released in June.

Geoff Vandenberg
extension 3021

4.0 COMPUTER STATIONERY

The following is a list of Computer Requisites available to Departments from the University Central Store (refer Store Catalogue of February 1980):

COMPUTER REQUISITES

CODE NUMBER	*DESCRIPTION*	*UNIT OF ISSUE*
17418	BINDER, Computer 381 mm x 279 mm (Top Opening) (15" x 11")	ONLY
17426	BINDER, Computer 279 mm x 279 mm (Side Opening) (11" x 11")	ONLY
17442	CARDS, Test Answer (Box of 2000)	BOX
17493	FORMS, Card Data	PAD
17515	FORMS, Fortran Coding	PAD
17582	PAD, Computer Requisition	ONLY
17590	TAPE, Paper 25 mm x 203 mm Channel Black (1" x 8")	ROLL
17604	ROLL, Teletype 214 mm ($8\frac{7}{16}$")	ROLL
17612	RIBBON, Suit 33 + 35 Teletype	ONLY
17620	PAPER, 279 mm x 216 mm Fanfold Model 35 (11" x 8½")	BOX
17639	PAPER, for Texas Remote Control	ROLL
17647	PAPER, Fanfold Single 279 mm x 381 mm suit LA36 & TTY38 (11" x 15")	BOX
17655	RIBBON, for LA36 Decwriter Remote Terminal	ONLY
17663	PAPER, suit 43 Remote Terminal	PACKET 2500
17671	RIBBON, suit 43 Remote Terminal	CASSETTE

5.0 SYSTEM PERFORMANCE REPORTS

With this issue of the Newsletter we are commencing the regular publication of monthly System Performance Reports which summarize the performance of the major network nodes, that is, the KA10, the KL10, and the two DN87 communications processors, during the preceding month. With each monthly report we will include comment or explanation in respect of any unusual features. In this Newsletter we are including reports for January, February and March so that the series will be complete for the year 1980.

There are two aspects of System performance which are important to users, particularly interactive users. Firstly, the System should be fully available for normal use during published operating times, that is, downtime due to fault recovery should be minimized. Secondly, the occurrence of faults or crashes which cause users to lose results of processing (and patience) should be minimized. It is the occurrence of crashes which is so frustrating, even though the time to recover may be quite small.

Both of these aspects are highlighted in the Performance Reports.

The report for each of the KL10 and the KA10 Systems consists of numbered lines containing times in hours and minutes and equivalent percentages. The report for the KA10 contains only one pair of columns (times and percentages) because the whole KA10 constitutes a network node. The report for the KL10, on the other hand, contains three pairs of columns because in addition to the central processor, which is a node in it's own right, the System contains two DN87 communications processors for which separate error logs are kept.

The two communications processors are named DN87A and DN87B. Their performance is reported seperately because all KL10 users are connected via one or other of the DN87s. If a fault occurs on either DN87 then usually users connected to the other DN87 are not affected. If a fault occurs in the KL10 itself, all users are affected.

The times and percentages have the following meanings:

The number of working days in the month is the number of days when the System was turned on for any purpose.

1. Total System Running Time:

   is the total time for the month that the System was turned on and running for any reason, including times that the System was running for for dedicated Centre purposes and would not normally have been available to users anyway - for example, scheduled maintenance from 6 am to 8 am, or software testing on Saturday.

Lines 2, 3, & 4 summarize the times when the System was operating normally but was not available for general use.

2. Scheduled Maintenance:

is the time that was preallocated to preventive maintenance. This usually does not exceed about one hour per working day plus other scheduled times, for instance during a Saturday, when the System would not normally have been available for users.

3. Dedicated Operating Tasks:

is the time required to perform such necessary housekeeping tasks as backup of public disk structures, which cannot be done during normal timesharing. Usually around one hour per week is required for the KL10 and about twenty minutes a week for the KA10.

4. Dedicated Systems Development:

is the time required by Systems programmers for purposes of testing new or modified system software, for example, a new version of the Monitor. What times are acceptable here necessarily vary a great deal. Generally, most of this sort of testing is done outside normal operating times when most users are in bed.

5. Time Scheduled for Use:

is the total time planned for the System to be available for general use. That is, it is a summary of times of normal operation as notified from time to time by the Centre.

Items 6 through 10 summarize times when the System should have been available for normal use but was not, for the reasons indicated. (Ideally, these conditions should not occur but in practice they can never be totally eliminated.) It must be recognised that any computer system - particularly a complex one containing many thousands of components - will fail from time to time and users should plan their work accordingly.

Items 6 through 9 are conditions that are due to faults arising within the System itself. The Centre aims to reduce the occurrence of such errors to the minimum but in practice, we have to settle on a fault level which we regard as practically attainable. We aim therefore for not more than six system crashes per month and for lost time not to exceed 2.5% of the Time Scheduled for Use.

Item 10 on the other hand summarizes conditions which interrupt normal operations but which are external to the System and largely outside the control of the Centre.

In the case of the KL10, items 6 through 9 are different for each of the KL10 and the two DN87s. It should be noted that downtime for KL10 processor is not counted as downtime for the DN87s so that the DN87s appear to have higher effective user uptime than the KL10. Of course users can not do any computing for more than the effective uptime for the KL10.

6. Unscheduled Maintenance:

   is the total time required for hardware maintenance outside of scheduled maintenance. This usually is due to the occurrence of some elusive hardware problems which happen from time to time.

7. Hardware Faults:

   is the total time due to faults definitely attributable to hardware.

8. Software Faults:

   is the total time due to faults definitely attributable to software.

9. Unresolved:

   is the total time due to faults which may have been due to either hardware or software or a combination of both. Times in this category should be very low and are usually due to some transient condition which could not be reproduced.

10. Environmental Conditions:

    is the total time that the System was not available due to some external factor such as a power supply failure (for example, a power strike), or to an air conditioning failure. This time should usually be minimal but is really not very predictable.

11. Time Available to Users:

    is the total time that the System was actually available for normal use. This time should be at least 97.5% of Time Scheduled for Use. This percentage is calculated and appears as Item 12.

12. Effective User Uptime:

    is the actual time available to users expressed as a percentage of the Time Scheduled for Use, that is, item 11 divided by item 5.

13. Number of Crashes:

is the total number of crashes which have occurred during the Time Scheduled for use. That is, the total number of hardware, software and unresolved faults during the period. KL10 and KA10 crashes are more disastrous than DN87 crashes. Users can usually continue with their work following a DN87 crash by reattaching to their jobs which are still running in the KL10 or KA10. This is because the DN87's perform only network switching operations while the KA10 and KL10 are computing nodes. However, jobs that are transferring files between processors via a switching node that has crashed will usually always have to be restarted.

14. Mean Availability between Crashes:

is the average time between crashes during the period.

15. Mean Time to Recover Crashes:

is the average time taken to rectify faults.

16. Total Number of Jobs:

is a simple count of all jobs run by all users, terminal and batch, during the period. It is included to give some measure of the relative loading on the Systems. We should expect that the likelihood of faults will increase on heavily loaded Systems.

January to March

KA10

The KA10 performance in January and February was satisfactory and the load was quite low up to the beginning of semester. In March, the large number of System crashes was due mostly to continuing intermittent memory parity errors. Unfortunately, these problems coincided with the high load at the start of semester.

KL10

The majority of problems since January have been due to faults in the communications system. There have been faults in both DEC supplied hardware and software and in software developed in the Centre. The standard DEC products are definitely not adequate to meet the needs of the University's network so that local development of required features is necessary. The communications system is very complex and while new versions of software and new features are tested as thoroughly as possible prior to implementation, some problems will only manifest themselves on-line. Sometimes these problems are very difficult

to trace. However, some major problems were cleared up by the end of March.

The majority of hardware problems were due to faults in the DMC-11 synchronous line drivers caused by bugs in their internal microcode stored in ROM. The defective ROM's were replaced during March and it is hoped that their performance will improve.

In addition to our own problems during March about twenty-two hours of time scheduled for use was lost due to power strikes. If we had not lost that time our effective user uptime would have been 97.1% for the KA10 and 98.9% for the KL10.

John Barker
Extension 3016

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S Y S T E M P E R F O R M A N C E R E P O R T

For node KL10 there were 29 working days in the period 1/Jan/80 to 31/Jan/80

		< KL10 >		< DN87A >		< DN37B >	
		HHH:MM	%	HHH:MM	%	HHH:MM	%
1.	Total system running time	389:43	100.0	389:43	100.0	389:43	100.0
	less time used for:						
2.	Scheduled maintenance	33:30	8.6	33:30	8.6	33:30	8.6
3.	Dedicated operations tasks	13:37	3.5	13:37	3.5	13:37	3.5
4.	Dedicated systems development	12:10	3.1	12:10	3.1	12:10	3.1
5.	Equals time scheduled for use	330:26	84.8	330:26	84.8	330:26	84.8
	less lost time due to:						
6.	Unschedlued maintenance	0:55	0.2	0:00	0.0	0:00	0.0
7.	Hardware faults	0:13	0.1	0:05	0.0	0:00	0.0
8.	Software faults	3:32	0.9	0:08	0.0	0:17	0.1
9.	Unresolved	0:17	0.1	1:00	0.3	0:30	0.1
10.	Environmental conditions	0:11	0.0	0:11	0.0	0:11	0.0
11.	Equals time available to users	325:18	83.5	329:02	84.4	329:28	84.5
12.	Effective user uptime (11./5.)		98.4		99.6		99.7

13.	Number of crashes	31
14.	Mean availability between crashes	10:30
15.	Mean time to recover crashes (minutes)	8
16.	Total number of Jobs	15814

21	
15:40	
3	

15
21:58
3

S Y S T E M P E R F O R M A N C E R E P O R T

For node KA10 there were 25 working days in the period 1/Jan/80 to 31/Jan/80

		HHH:MM	%
1.	Total system running time	375:14	100.0
	less time used for:		
2.	Scheduled maintenance	38:00	10.1
3.	Dedicated operations tasks	4:41	1.2
4.	Dedicated systems development	0:00	0.0
5.	Equals time scheduled for use	332:33	88.6
	less lost time due to:		
6.	Unschedlued maintenance	0:38	0.2
7.	Hardware faults	0:04	0.0
8.	Software faults	0:03	0.0
9.	Unresolved	0:00	0.0
10.	Environmental conditions	0:05	0.0
11.	Equals time available to users	331:43	88.4
12.	Effective user uptime (11./5.)		99.7

13.	Number of crashes	2
14.	Mean availability between crashes	165:52
15.	Mean time to recover crashes (minutes)	4
16.	Total number of Jobs	2606

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S Y S T E M P E R F O R M A N C E R E P O R T

For node KL10 there were 29 working days in the period 1/Feb/80 to 29/Feb/80

		HHH:MM	%	HHH:MM	%	HHH:MM	%
1.	Total system running time	415:19	100.0	415:19	100.0	415:19	100.0
	less time used for:						
2.	Scheduled maintenance	44:42	10.8	44:42	10.8	44:42	10.8
3.	Dedicated operations tasks	8:09	2.0	8:09	2.0	8:09	2.0
4.	Dedicated systems development	7:26	1.8	7:26	1.8	7:26	1.8
5.	Equals time scheduled for use	355:02	85.5	355:02	85.5	355:02	85.5
	less lost time due to:						
6.	Unschedlued maintenance	2:46	0.7	0:00	0.0	0:00	0.0
7.	Hardware faults	0:25	0.1	0:00	0.0	0:00	0.0
8.	Software faults	0:32	0.1	0:20	0.1	0:20	0.1
9.	Unresolved	0:18	0.1	0:33	0.1	1:08	0.3
10.	Environmental conditions	0:00	0.0	0:00	0.0	0:00	0.0
11.	Equals time available to users	351:01	84.5	354:09	85.3	353:34	85.1
12.	Effective user uptime (11./5.)		98.9		99.8		99.6

13.	Number of crashes	7	7	8
14.	Mean availability between crashes	50:09	50:36	44:12
15.	Mean time to recover crashes (minutes)	11	8	11
16	Total number of Jobs	14521		

S Y S T E M P E R F O R M A N C E R E P O R T

For node KA10 there were 27 working days in the period 1/Feb/80 to 29/Feb/80

		HHH:MM	%
1.	Total system running time	392:36	100.0
	less time used for:		
2.	Scheduled maintenance	43:30	11.1
3.	Dedicated operations tasks	4:31	1.2
4.	Dedicated systems development	0:00	0.0
5.	Equals time scheduled for use	344:35	87.8
	less lost time due to:		
6.	Unschedlued maintenance	2:06	0.5
7.	Hardware faults	0:47	0.2
8.	Software faults	0:05	0.0
9.	Unresolved	0:05	0.0
10.	Environmental conditions	0:00	0.0
11.	Equals time available to users	341:32	87.0
12.	Effective user uptime (11./5.)		99.1

13.	Number of crashes	7
14.	Mean availability between crashes	48:47
15.	Mean time to recover crashes (minutes)	8
16.	Total number of Jobs	2289

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S Y S T E M P E R F O R M A N C E R E P O R T

For node KL10 there were 30 working days in the period 1/Mar/80 to 31/Mar/80

		< KL10 >		< DN87A >		< DN87B >	
		HHH:MM	%	HHH:MM	%	HHH:MM	%
1.	Total system running time	437:58	100.0	437:58	100.0	437:58	100.0
	less time used for:						
2.	Scheduled maintenance	34:32	7.9	34:32	7.9	34:32	7.9
3.	Dedicated operations tasks	9:53	2.3	9:53	2.3	9:53	2.3
4.	Dedicated systems development	30:44	7.0	30:44	7.0	30:44	7.0
5.	Equals time scheduled for use	362:49	82.8	362:49	82.8	362:49	82.8
	less lost time due to:						
6.	Unschedlued maintenance	2:26	0.6	0:00	0.0	0:00	0.0
7.	Hardware faults	0:00	0.0	0:00	0.0	0:30	0.1
8.	Software faults	1:02	0.2	0:04	0.0	0:00	0.0
9.	Unresolved	0:20	0.1	1:34	0.4	0:41	0.2
10.	Environmental conditions	22:12	5.1	22:12	5.1	22:12	5.1
11.	Equals time available to users	336:49	76.9	338:59	77.4	339:26	77.5
12.	Effective user uptime (11./5.)		92.8		93.4		93.6

13.	Number of crashes	7	6	10
14.	Mean availability between crashes	48:07	56:30	33:57
15.	Mean time to recover crashes (minutes)	12	16	7
16.	Total number of Jobs	10769		

S Y S T E M P E R F O R M A N C E R E P O R T

For node KA10 there were 30 working days in the period 1/Mar/80 to 31/Mar/80

		HHH:MM	%
1.	Total system running time	415:46	100.0
	less time used for:		
2.	Scheduled maintenance	30:15	7.3
3.	Dedicated operations tasks	7:57	1.9
4.	Dedicated systems development	11:45	2.8
5.	Equals time scheduled for use	365:49	88.0
	less lost time due to:		
6.	Unschedlued maintenance	4:48	1.2
7.	Hardware faults	4:15	1.0
8.	Software faults	0:44	0.2
9.	Unresolved	0:44	0.2
10.	Environmental conditions	22:11	5.3
11.	Equals time available to users	333:07	80.1
12.	Effective user uptime (11./5.)		91.1

13.	Number of crashes	26
14.	Mean availability between crashes	12:49
15.	Mean time to recover crashes (minutes)	13
16.	Total number of Jobs	9808

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